

All Hazards Mitigation Plan Update

Clermont County, Ohio

Risk Analysis Meeting

October 31, 2012



Introductions



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Meeting Agenda



Outline

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plan - Overview
4. Risk Analysis Overview
5. Hazard Profiles
6. Vulnerability Rankings
7. Mitigation Project Development

Hazard Mitigation Plan - Goals



Hazard Mitigation Plan Goal

1. Protect lives and property through identification of Clermont County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

Today's Meeting Goal

1. Review Hazard Profiles and Initial Vulnerability Rankings
2. Begin Development of Mitigation Actions

Hazard Mitigation Plan - Overview



Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance





Primary Hazards

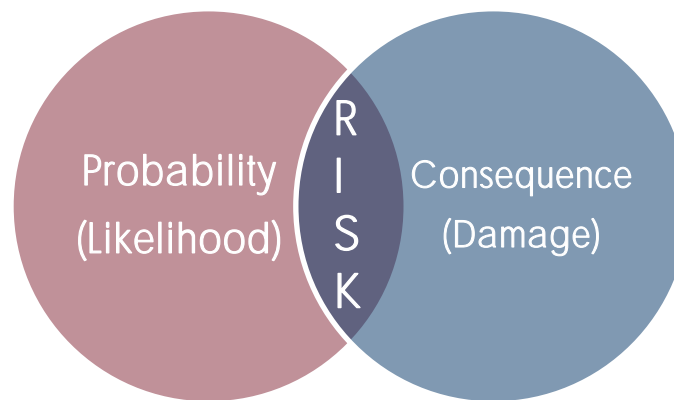
- | | |
|------------------|------------------------|
| 1. Severe Storms | 6. Earthquakes |
| 2. Flooding | 7. Hazardous Materials |
| 3. Tornadoes | 8. Dam Failure |
| 4. Landslides | 9. Utility Failures |
| 5. Droughts | 10. Invasive Species |

Hazard Risk Analysis



Methodology

1. Calculate Event Probabilities
2. Determine Potential Impacts
 - Economic Damage, Population, Critical Facilities
3. Calculate Risks / Vulnerabilities



Hazard Risk Analysis



Data Sources

1. FEMA's HAZUS-MH

- Flooding and Earthquakes

2. Historic Events

- Tornadoes, Severe Storms, Excessive Heat, Extreme Cold, Severe Winter Storms, Landslides

3. Additional Studies

- Drought, USACE Dam Failure, Ohio EMA, ODNR

4. Qualitative Assessments

- Dam Failure, Hazardous Materials, Invasive Species, Utility Failure

Hazard Risk Analysis – Severe Storms



Summary of Events & Future Probability

- 199 Events from 1965 -2011
 - Damages: \$29,148,000
 - Life Loss: 2
 - Injuries: 19
- Annual Chance of Occurrence = 100%
- Annualized Risk
 - Damages: \$620,170
 - Life Loss: 0.04
 - Injuries: 0.40

Ind. Annual Probabilities

Hail: 100%

Wind: 63%

Lightning: 86%

Thunderstorm: 100%

Hazard Risk Analysis – Severe Winter Storm



Summary of Events & Future Probability

- 54 Events from 1993 -2011
 - Damages*: \$18,342,000
 - Life Loss*: 5
 - Injuries*: 32
- Annual Chance of Occurrence = 35%
- Annual Risk:
 - Damages*: \$965,368
 - Life Loss*: 0.26
 - Injuries*: 1.68

* Event data based on regional totals. Specific impacts to Clermont County unknown.

Hazard Risk Analysis – Flooding



Summary of Events & Future Probability

- 81 Events from 1993 -2012
 - Damages: \$25,352,000
 - Life Loss: 2
 - Injuries: 1
- Annual Chance of Occurrence = 100%
- Annual Risk:
 - Damages: \$1,334,316
 - Life Loss: 0.1
 - Injuries: 0.05
- HAZUS-MH:
 - Average Annualized Loss = \$18,637,000

FEMA Flood Insurance

Claims: 178

Value: \$8,401,436

Hazard Risk Analysis – Flooding



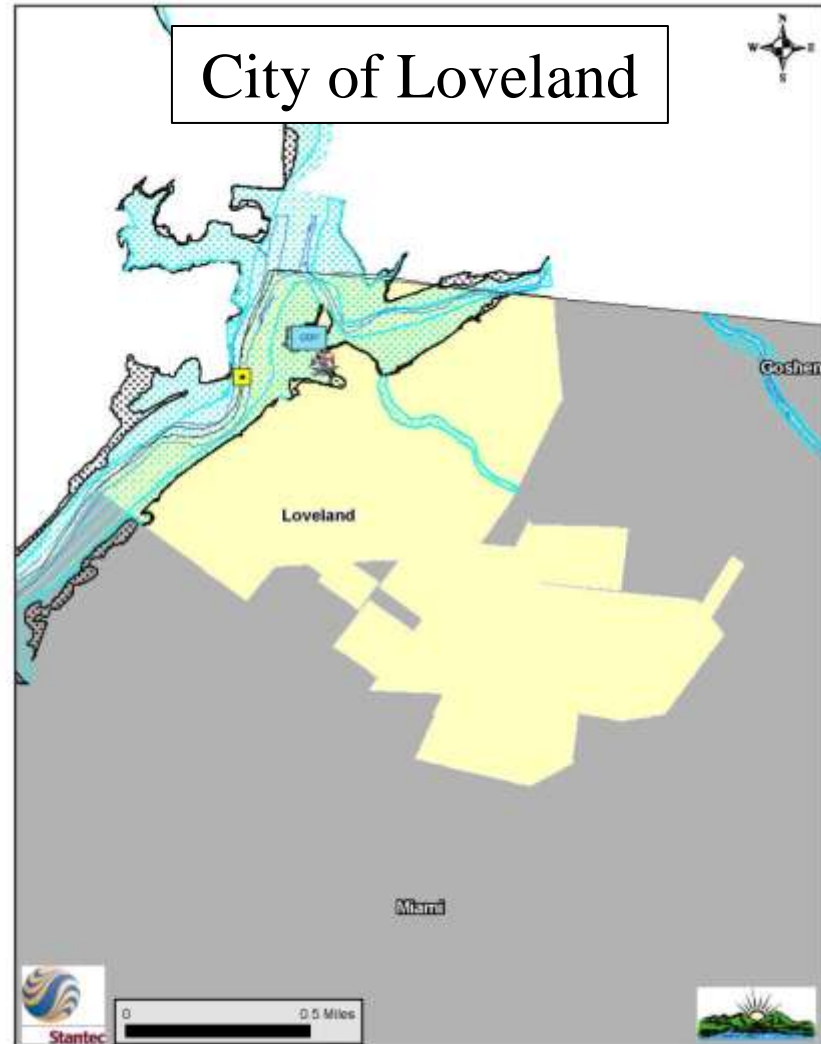
Streams &
Communities
Affected

Critical Facilities – At Risk of Flooding

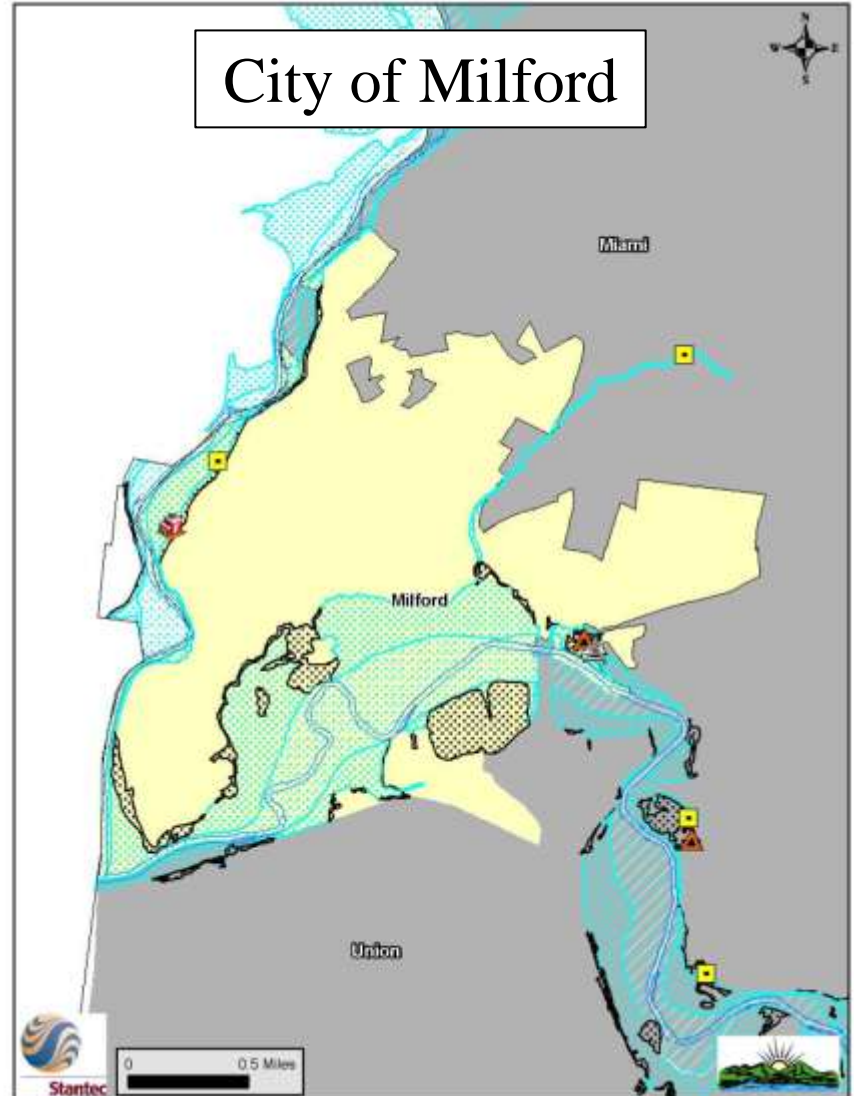
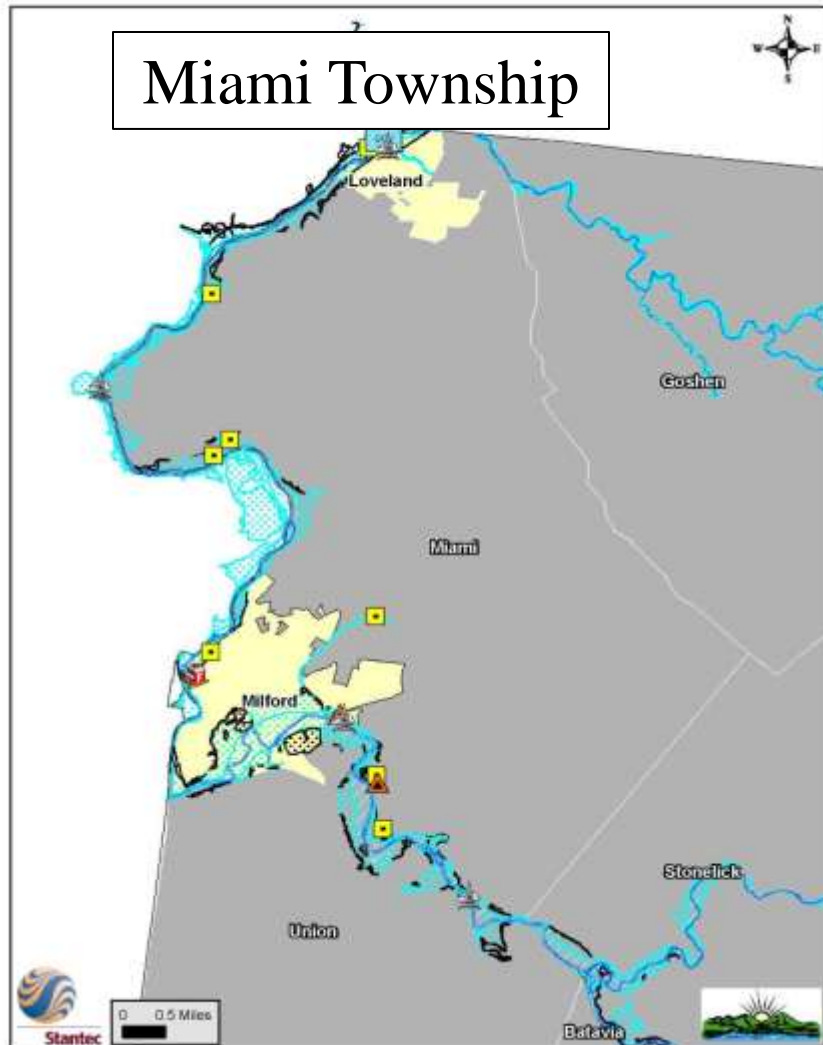


Legend

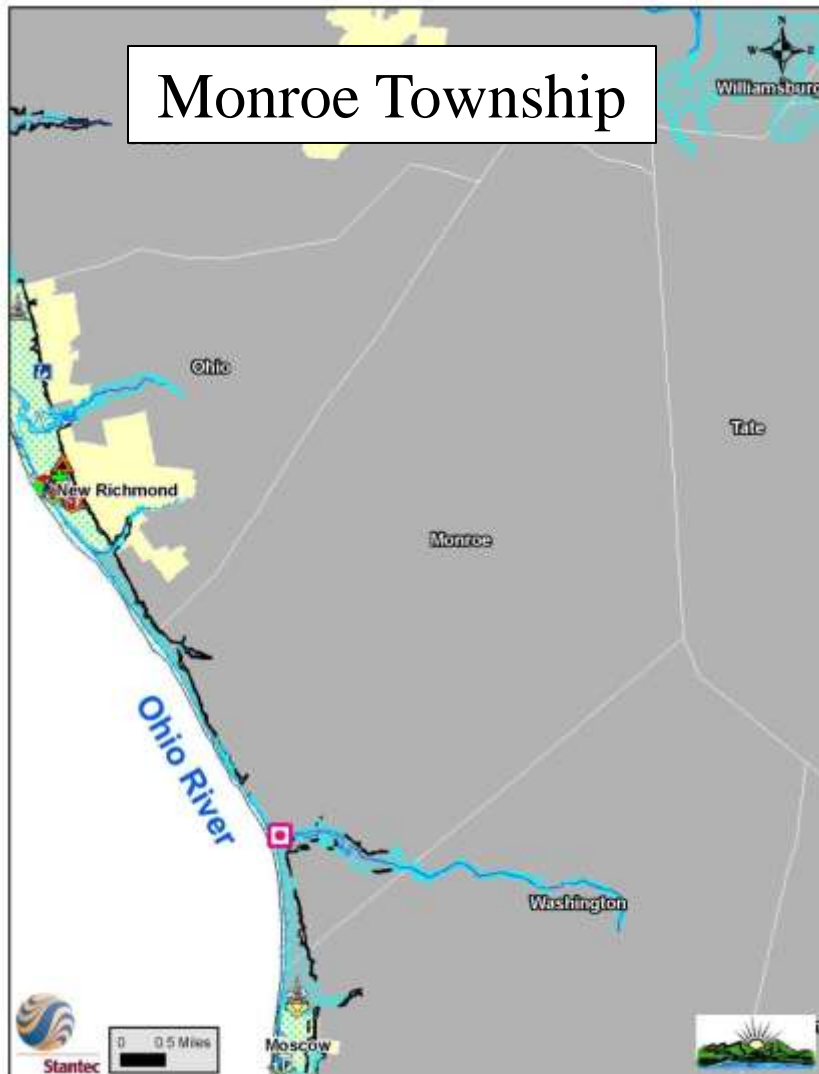
-  Libraries FP
-  Cell Phone Towers FP
-  Power Plants FP
-  Nursing Homes FP
-  Government FP
-  Hazardous Materials FP
-  Utilities FP
-  Historical Structures FP
-  Fire Station Facilities FP
-  Police Station Facilities FP
-  Daycares FP
-  School Facilities FP



Critical Facilities – At Risk of Flooding



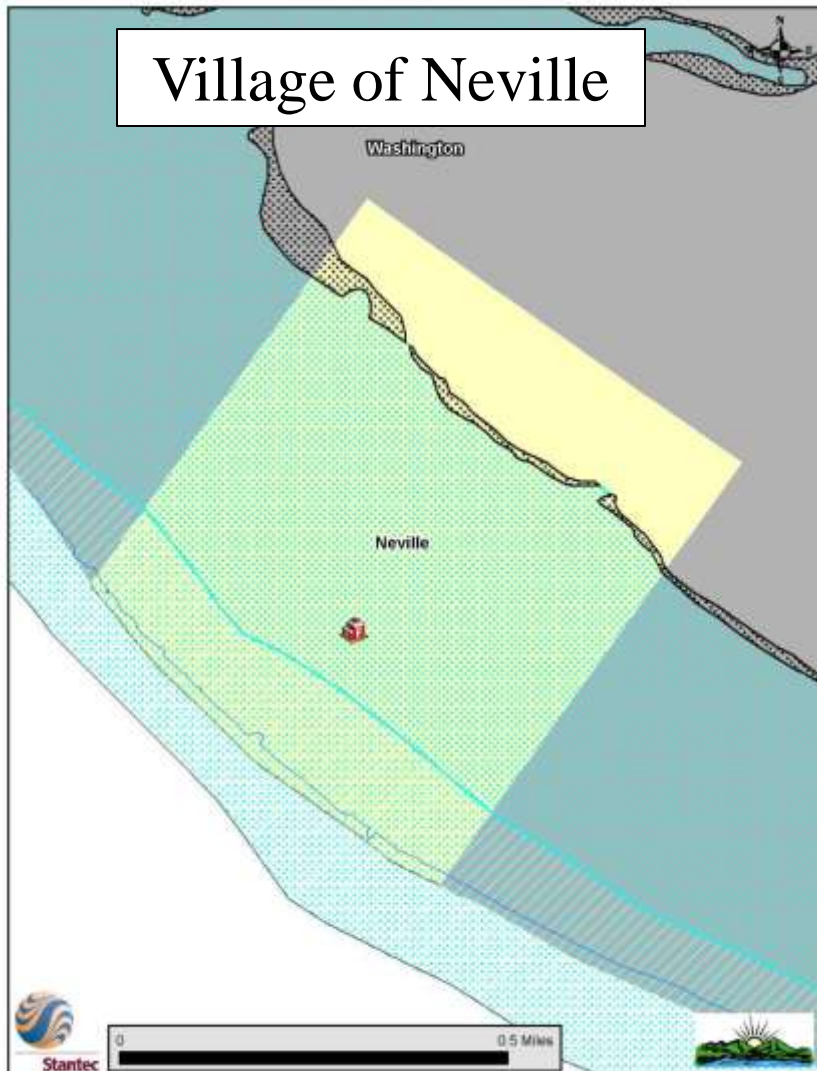
Critical Facilities – At Risk of Flooding



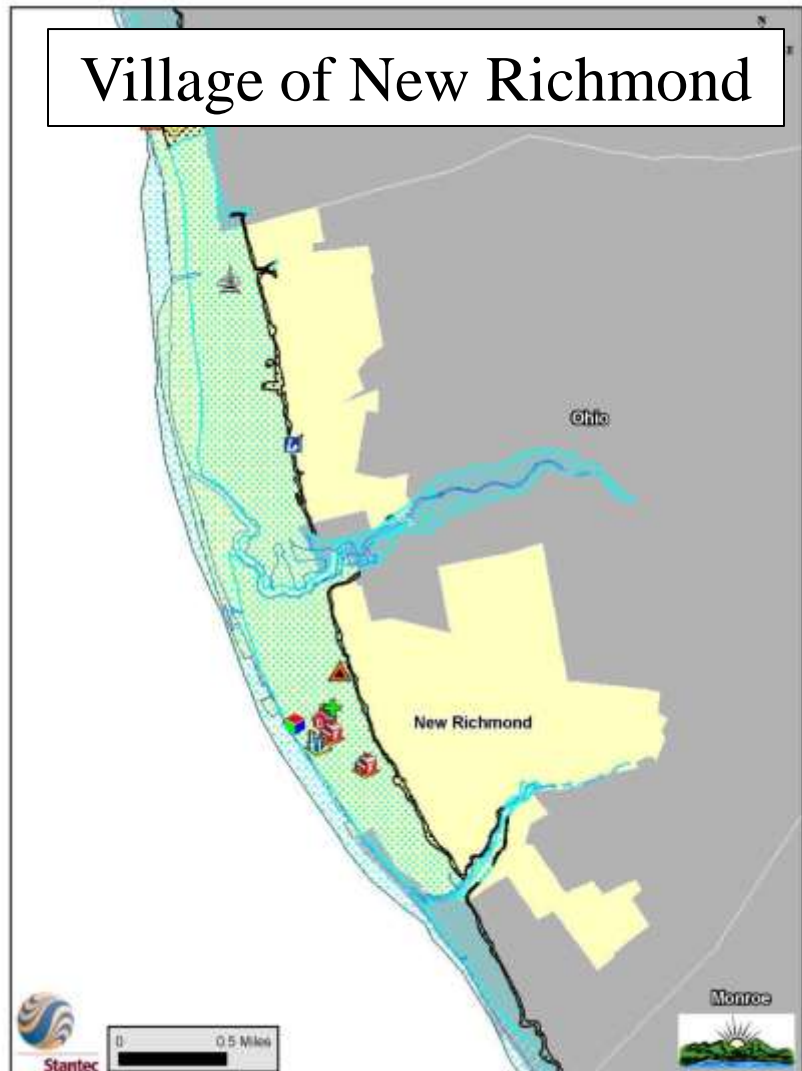
Critical Facilities – At Risk of Flooding



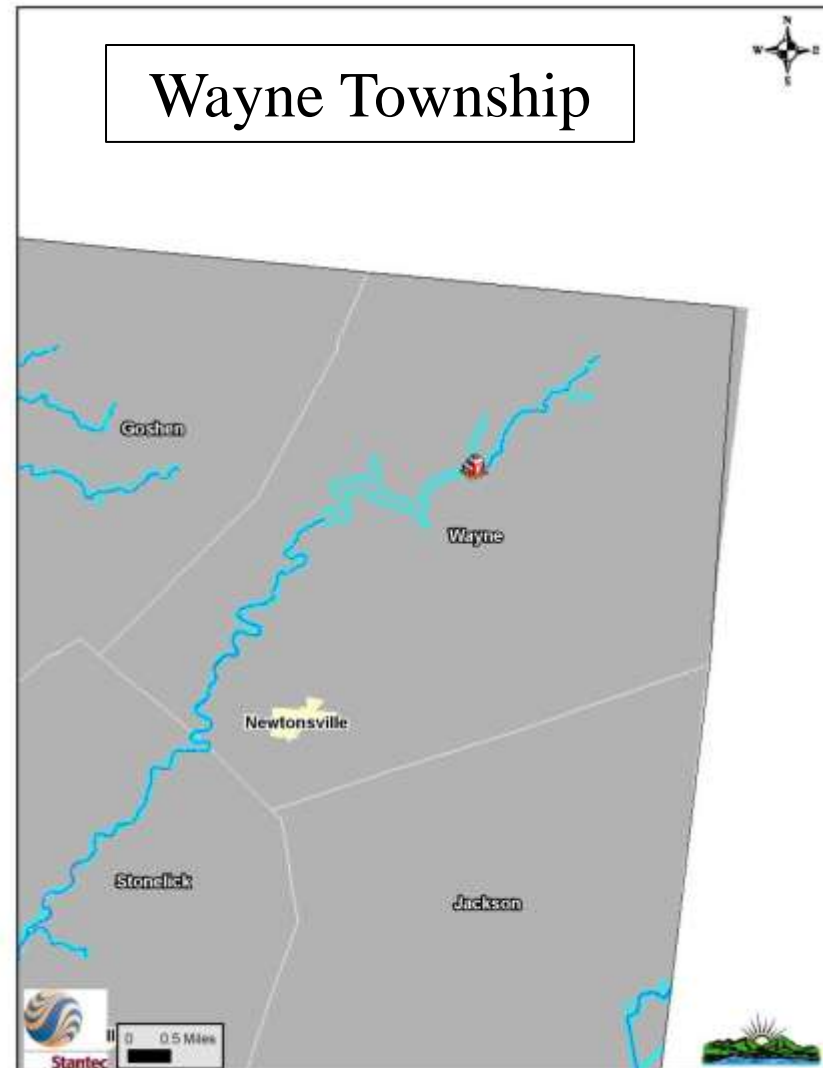
Village of Neville



Village of New Richmond



Critical Facilities – At Risk of Flooding



Hazard Risk Analysis – Flooding

Structural Vulnerability – Community



Community	Number	Value (\$)
Batavia Township	4	192,000
Batavia, Village of	2	59,700
Chilo, Village of	50	1,970,200
Franklin Township	58	2,002,550
Goshen Township	20	1,920,800
Jackson Township	1	198,500
Loveland, City of	80	6,787,290
Miami Township	122	23,632,730
Milford, City of	96	25,999,240
Monroe Township	65	4,082,800
Moscow, Village of	114	5,286,200
Neville, Village of	44	819,000
New Richmond, Village of	762	30,968,940
Ohio Township	49	1,944,200
Pierce Township	53	12,291,100
Stonelick Township	16	1,192,000
Tate Township	1	93,600
Union Township	20	704,400
Washington Township	29	2,827,700
Wayne Township	5	619,200
Williamsburg Township	1	93,700
Williamsburg, Village of	5	229,900
Total	1597	123,915,750

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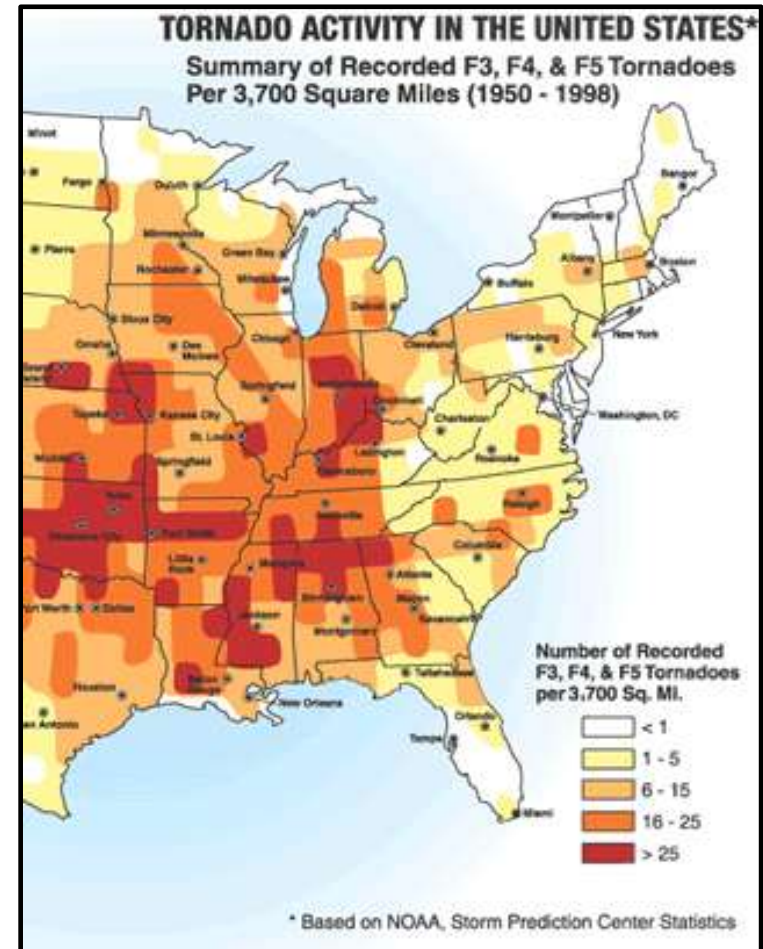
★ Structures Inside Floodplain

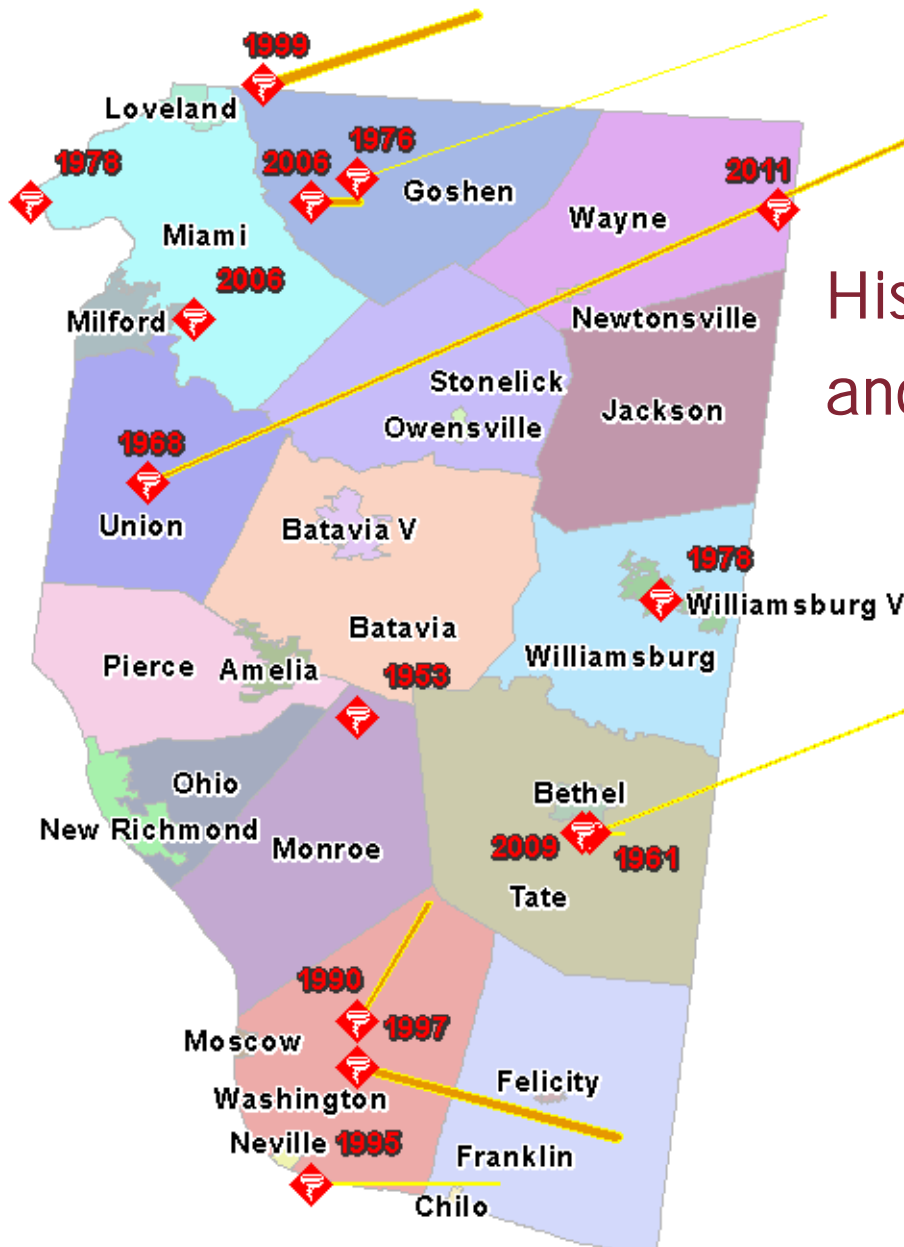
Hazard Risk Analysis – Tornadoes



Summary of Events & Future Probability

- 18 Events from 1953 -2012
 - Damages: \$11,453,000
 - Life Loss: 4
 - Injuries: 38
- Annual Chance of Occurrence = 23%
- Annualized Risk
 - Damages: \$190,883
 - Life Loss: 0.07
 - Injuries: 0.63





Historical Tornado Touchdowns and the March 2, 2012 Tornado.



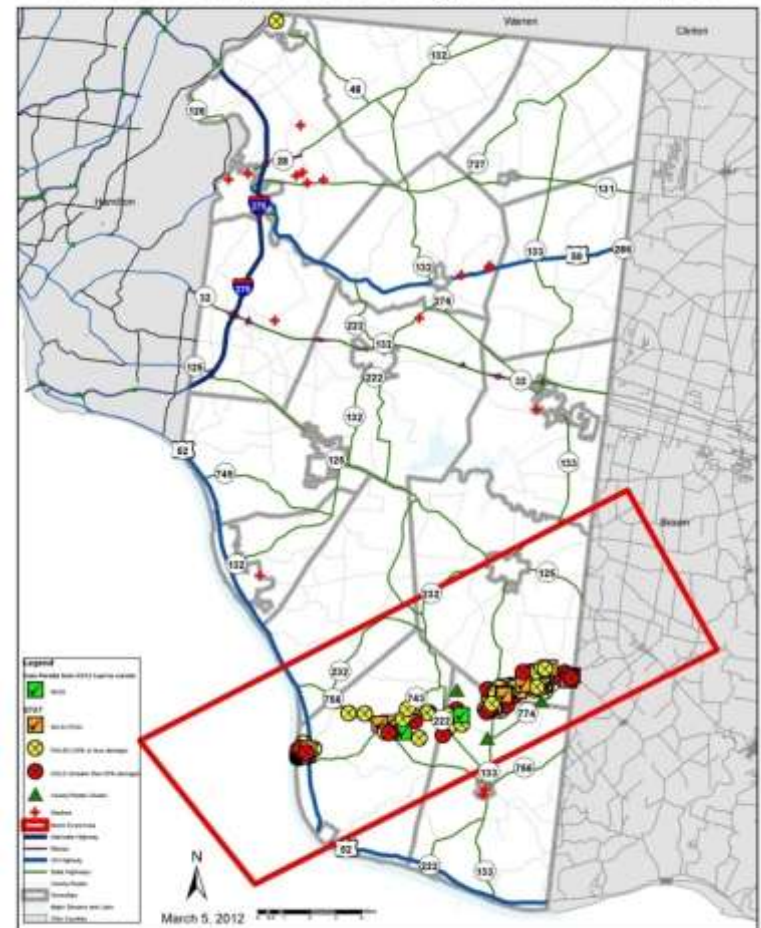
Hazard Risk Analysis – Tornadoes



Historical Event – March 2, 2012*

- Magnitude – EF 3
- Damages – \$3,700,000
- Village of Moscow Hardest hit - 120 Homes/Buildings Damaged/Destroyed
- Life Loss – 3
- Affected Communities – Village of Moscow, Washington Twp., Tate Twp., & Franklin Twp.

Clermont County Tornado Damage Area - March 2, 2012



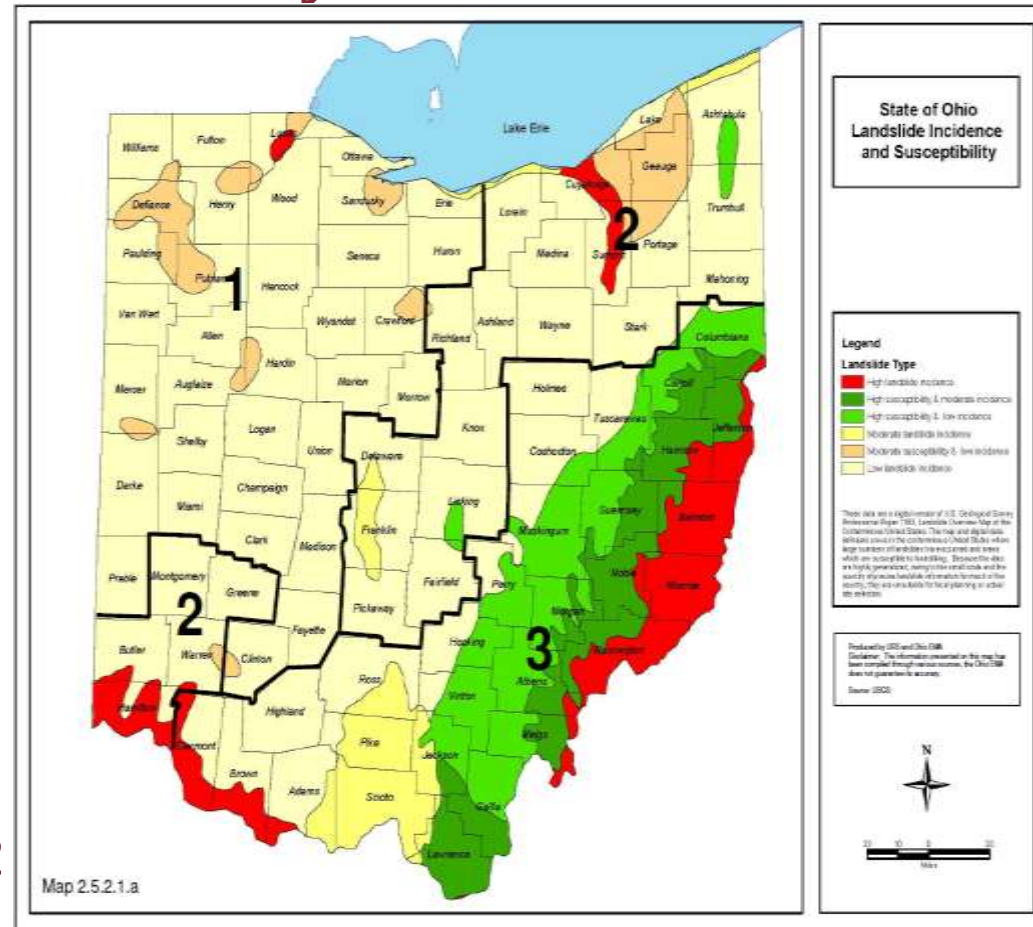
* Images and Information provided by Kelly Perry (GISP).

Hazard Risk Analysis – Landslides



Summary of Events & Future Probability

- No Detailed Historical Record
- State of Ohio Hazard Mitigation Plan
Methodology (Average Structure Value within the High Landslide Zone x 10 structures)
- Probability of Occurrence: Annual
- Estimated Loss: \$1,166,732



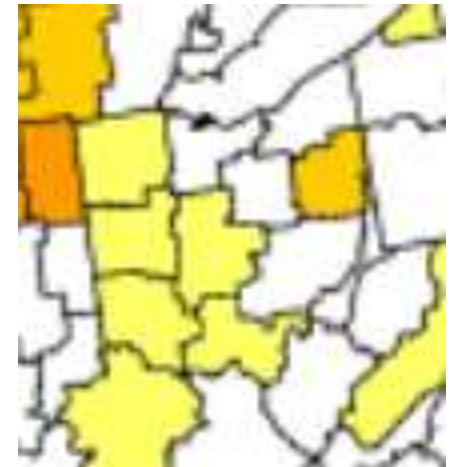
Hazard Risk Analysis – Drought

Summary of Events & Future Probability



- NCDC - 2 Events from 1914 -2012
 - Damages: Unknown to Clermont
- Annual Chance of Occurrence = 5% - 10% (PDSI)
- Farm Service Agency (FSA) Payments 2008 – 2010 = \$913,216 - Supplemental Revenue Assistance Payments Program (SURE)

September
22 PDSI
Index



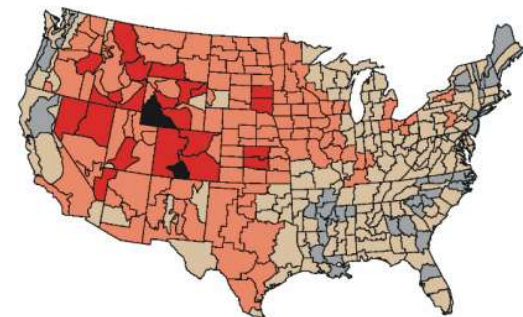
■ -2.0 to -2.9 (Moderate Drought)

According to NOAA's National Climatic Data Center, in 1999, a drought that affected twenty-eight Ohio counties caused \$200 million in crop damages. Source: State of Ohio Hazard Mitigation Plan, Drought Section

Palmer Drought Severity Index

1895–1995

Percent of time in severe and extreme drought



% of time PDSI ≤ -3

- Less than 5%
- 5% to 9.99%
- 10% to 14.9%
- 15% to 19.9%
- 20% or greater

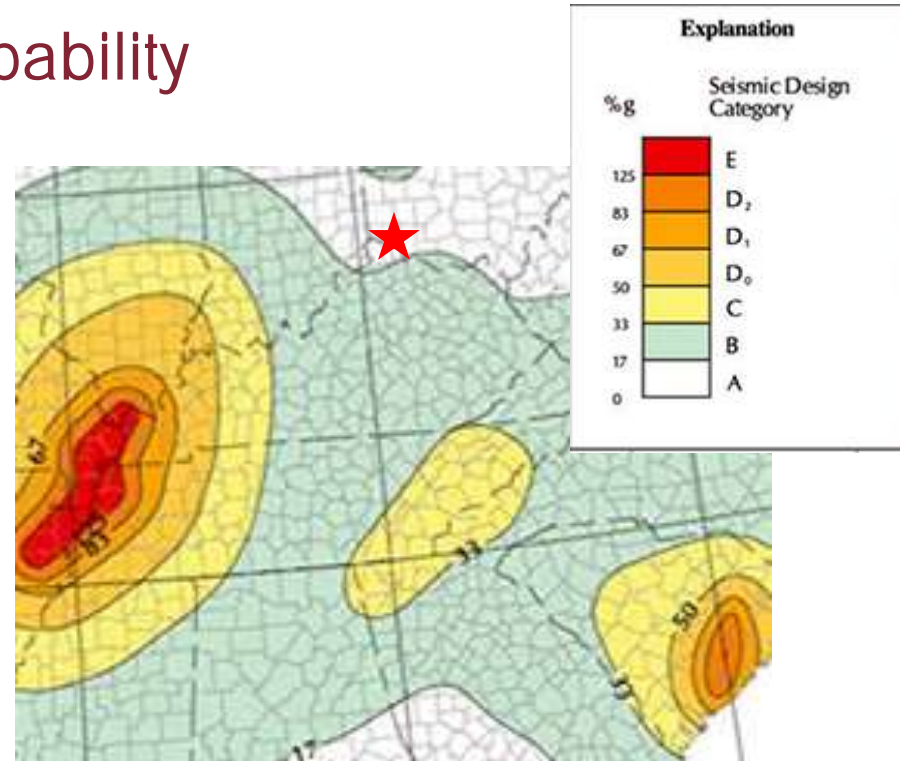
SOURCE: McKee et al. (1993); NOAA (1990); High Plains Regional Climate Center (1996)
Albers Equal Area Projection; Map prepared at the National Drought Mitigation Center

Hazard Risk Analysis – Earthquakes



Summary of Events & Future Probability

- 3 Earthquakes from 1804-1864
 - Damages: Unknown
 - Life Loss: Unknown
 - Injuries: Unknown
- Annual Chance of Occurrence
 - Minimal
- HAZUS – MH:
 - Average Annualized Loss: \$330,000



Hazard Risk Analysis – Hazard Material



Summary of Events & Future Probability

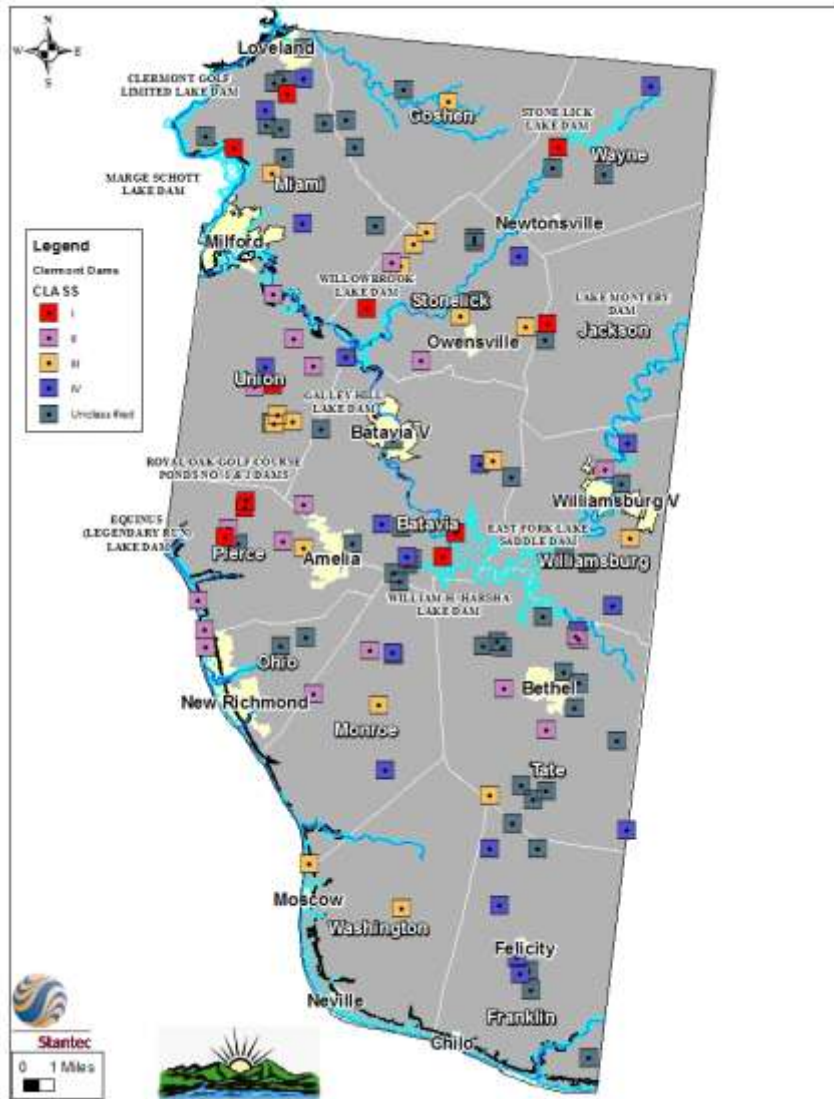
- No Detailed Historical Record of Accidents
- Probability of Occurrence: Unknown
- Potential Impacts:
 - Hazardous materials are stored throughout the County
 - Additionally multiple pipelines, rail corridors and transportation routes bisect the County



Summary of Events & Future Probability

- No Historical Record
- Probability of Occurrence: Low
- Potential Impacts:
 - Loss of Drinking Water Source
 - In-Flux of Flood Waters
 - Structures become inundated with Flood Waters

Hazard Risk Analysis – Dam / Levee Failure



- Classes: 1 – 4 (Higher to Lower Hazard)
- Dams (119 Total):
 - Class 1 = 11
 - Class 2 = 19
 - Class 3 = 17
 - Class 4 = 21
 - Unclassified = 51

Hazard Risk Analysis – Dam / Levee Failure

William H. Harsha Dam



- Dam and Levee Breach Analyses
Provided by USACE – Potential
Areas of Inundation Identified.
- Population At-Risk (2010 US
Census with an area weighted
calculation.)
 - William H. Harsha Dam –
3,327
- Property At-Risk (Structures Located
inside the Inundation Zones)
 - William H. Harsha Dam –
1,318 Buildings
 - \$195,619,820

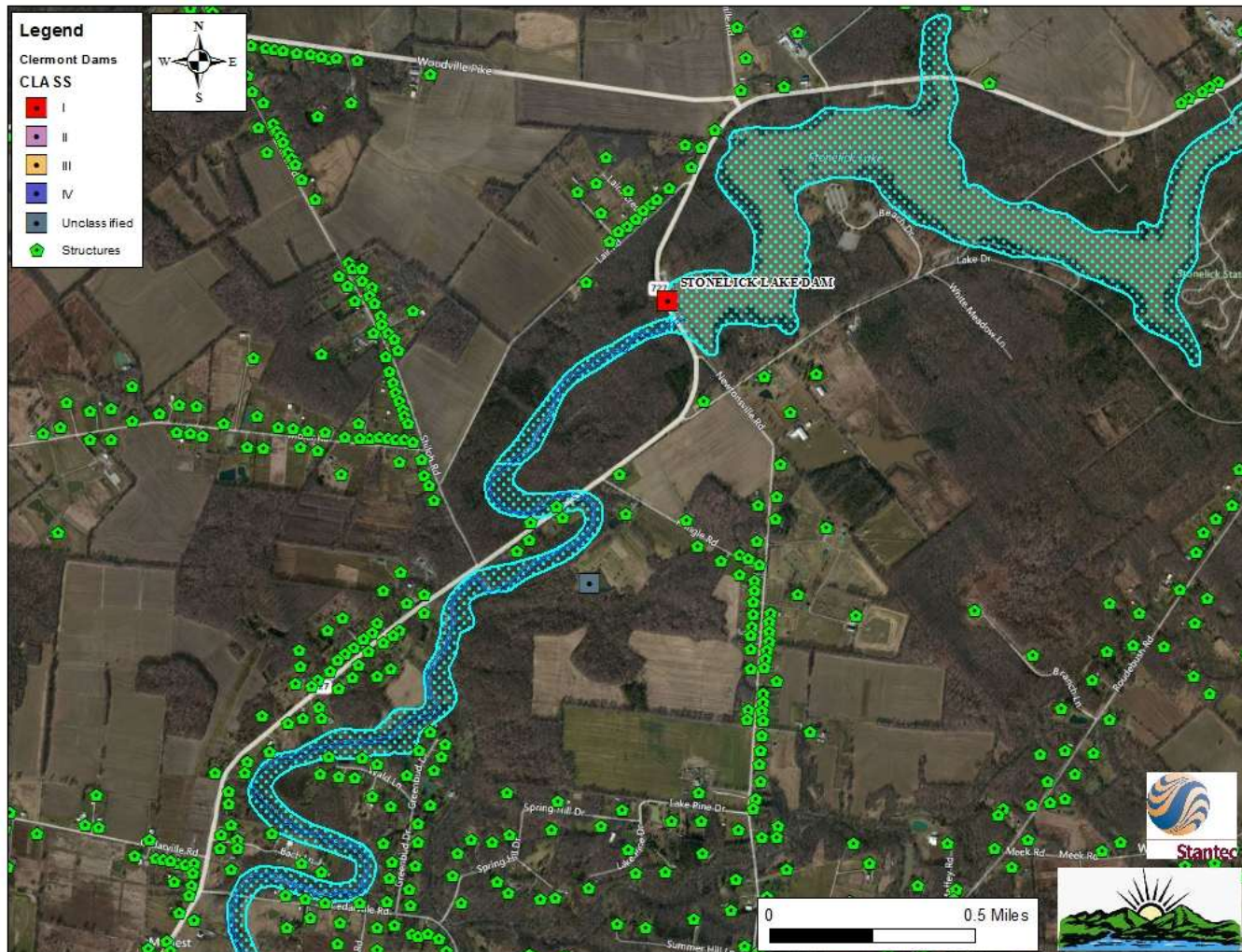
Hazard Risk Analysis – Dam / Levee Failure Caesar Creek Dam



- Dam and Levee Breach Analyses
Provided by USACE – Potential Areas
of Inundation Identified.
- Population At-Risk (2010 US Census
with an area weighted calculation.)
 - Caesar Creek Dam – 1,787
- Property At-Risk (Structures Located
inside the Inundation Zones)
 - Caesar Creek Dam – 776
Buildings
 - \$87,571,690

Hazard Risk Analysis – Dam / Levee Failure

Stonelick Lake Dam



Hazard Risk Analysis – Invasive Species



Summary of Events & Future Probability – Invasive Plants and Emerald Ash Borer

- No Detailed Historical Record.
- Probability of Occurrence: Unknown
- Potential Impacts: 6 of the top 10 invasive plants are found in Clermont County.

OHIO'S TOP TEN INVASIVE PLANTS

Japanese Honeysuckle
Japanese Knotweed
Autumn Olive
Buckthorns
Purple Loosestrife
Common Reed
Reed Canary Grass
Garlic Mustard
Multiflora Rose
Bush Honeysuckles

The Emerald Ash Borer which is currently impacting the north American Ash tree has already cost millions of dollars in attempts to identify and isolate infected trees.

The un-captured cost to treat Ash trees in Ohio will likely reach into the millions, as urban areas combat the insect.



Hazard Risk Analysis – Invasive Species



- Asian Longhorned Beetle (ALB)
 - Found in Tate Township in June 2011
 - Restricted Areas – Tate and Monroe Townships, and East Fork State Park
 - September 4, 2012 – Ohio Department of Agriculture announced the availability of \$2 million in funding to assist with the ALB
 - As of Sept. 4, 2012 8,716 Infested trees removed out of the 170,575 Surveyed
- Threat to Ohio's hardwood forests - \$2.5 Billion in standing maple & \$5 Billions Nursery Industry
- Asian Longhorned Beetle Cooperative Eradication Program in Clermont County, Ohio Environmental Assessment May 2012
- US Department of Agriculture



Hazard Risk Analysis – Utility Failure



Summary of Events & Future Probability

- No Detailed Historical Record of Accidents
- Probability of Occurrence: Unknown
- Potential Impacts:
 - Extended Periods of Power Loss
 - Disruption of Communication
 - Potential Loss of Income
 - Impacts associated with Utility Failure unknown

Hazard Risk Analysis – Prioritization



Historical/Probability	
Low (1)	0 to 10 occurrences in the last 50 years
Medium (2)	11 to 50 occurrences in the last 50 years
High (3)	More than 50 occurrences in the last 50 years

Vulnerability	
Low (1)	Less than 10% of the total population of the jurisdiction
Medium (2)	10% to 25% of the total population of the jurisdiction
High (3)	More than 25% of the total population of the jurisdiction

Severity of Impact	
Low (1)	Minor injuries (under 50) & property damage (under \$1,000,000), or less than 24 hour shutdown of essential facilities
Medium (2)	Serious injury (more than 50), major property damage (structural stability) (\$1,000,001 to \$15,000,000), or 24 to 72 hour shutdown of essential facilities
High (3)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (more than \$15,000,000), or more than 3 days of shutdown for essential facilities

Hazard Risk Analysis – Prioritization



Hazard	Average Annualized Loss (\$)	Probability	Vulnerability	Severity of Impact	Total
Severe Storm	620,170	3	2	1	6
Severe Winter Storm	Unknown	2	2	1	5
Flooding	1,334,316	3	2	2	7
Tornadoes	190,883	2	1	2	5
Landslides	1,166,732	2	1	2	5
Drought	304,405	1	2	1	4
Earthquakes	330,000	1	2	1	4
Hazardous Material Accidents	Unknown	1	1	2	4
Dam/Levee Failure	Unknown	1	1	3	5
Invasive Species	Unknown	2	1	2	5
Utility Failure	Unknown	1	2	2	5

Low	3-4
Guarded	5
Elevated	6
High	7
Severe	8-9

Hazard Risk Analysis – Prioritization



Community	Severe Storm	Severe Winter Storm	Flooding	Tornadoes	Landslides	Drought*	Earthquakes*	Hazard Material Accidents*	Dam/Levee Failure*	Invasive Species	Utility Failure
Amelia, Village of	7	6	3	6	4	3	3	4	3	4	4
Batavia Township	6	5	6	5	4	6	4	6	5	5	4
Batavia, Village of	7	6	4	6	5	3	3	4	6	4	4
Bethel, Village of	7	6	3	6	3	3	3	3	3	4	4
Chilo, Village of	7	6	4	6	4	3	3	4	3	4	4
Felicity, Village of	7	6	3	6	3	3	3	3	3	4	4
Franklin Township	6	5	6	5	4	5	4	3	3	5	4
Goshen Township	6	5	6	5	3	5	4	4	3	5	4
Jackson Township	6	5	6	5	3	6	4	5	3	5	4
Loveland, City of	7	5	4	6	5	3	3	3	4	4	4
Miami Township	6	6	6	6	6	3	5	6	5	5	5
Milford, City of	7	5	4	6	5	3	3	4	6	4	4
Monroe Township	6	5	6	5	4	5	4	5	3	5	4
Moscow, Village of	7	6	5	6	4	3	3	5	3	4	4
Neville, Village of	7	6	4	6	4	3	3	4	3	4	4
New Richmond, Village of	7	6	4	6	6	3	3	5	3	4	4
Newtonsville, Village of	7	6	3	6	3	3	3	3	3	4	4
Ohio Township	6	5	6	5	4	3	4	4	3	5	4
Owensville, Village of	7	6	3	6	3	3	3	4	3	4	4
Pierce Township	6	5	6	5	5	3	4	5	4	5	4
Stonelick Township	6	5	6	5	3	5	4	3	4	5	4
Tate Township	6	5	6	5	3	5	4	3	3	5	4
Union Township	6	6	6	6	5	3	5	6	5	5	5
Washington Township	6	5	6	5	4	5	4	5	3	5	4
Wayne Township	6	5	6	5	3	5	4	3	4	5	4
Williamsburg Township	6	5	6	5	4	5	4	4	3	5	4
Williamsburg, Village of	7	6	4	6	5	3	3	4	3	4	4

* Countywide Events were used in the ranking.

Low	3-4
Guarded	5
Elevated	6
High	7
Severe	8-9

Mitigation Project Development



Mitigation Project Types

1. Preventative Actions
2. Property Protection
3. Emergency Services
4. Structural Projects
5. Public Information

Mitigation Project Development

2006 HMP Activities



Severe Storms

Use educational outreach (PSAs) to teach residents the importance of ditch maintenance and piping. Coordinate outreach with SWCD. Create "hotspot" database.

Develop a memorandum of understanding between communities to plan for severe storm recovery.

Develop several condition levels for severe storm events. Endorse the existing operating conditions (1-5).

Flooding

Widen distribution of video for school age children and develop one for adults. (all flooding)

Establish a storm water master plan and storm water utility.

Widen distribution of video for school age children and develop one for adults. (high hazard areas)

Widen distribution of video for school age children and develop one for adults. (youth in high hazard areas) Seek funding to build water facilities in parks (include water safety).

Evaluate locations for signage at repeated high water locations.

Use educational outreach (PSAs) to teach residents the importance of ditch maintenance and piping. Coordinate outreach with SWCD. Create a "hotspot" database.

Mitigation Project Development

2006 HMP Activities



Tornadoes

Create innovative PSAs on the use of weather radios and seek funding to place weather radios in all critical facilities.

Seek funding for a countywide inter-operable warning system.

Seek funding to install multiuse shelters in parks. Work with mobile home parks to install tornado shelters.

Landslides

Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)

Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)

Work with the Engineer's office to create a memorandum of understanding with other agencies.

Mitigation Project Development

2006 HMP Activities



Drought

Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.

Develop a map of sensitive populations.

Develop a PSA to define the use of dry hydrants (work with SWCD).

Earthquake

Develop a PSA concerning the effects of earthquakes in Clermont County; target school age children.

Mitigation Project Worksheet



CLERMONT COUNTY HAZARD MITIGATION PLAN

Mitigation Strategy

October 31, 2012

Community Name _____ Contact Name _____ Contact Phone No. _____

Mitigation Goals:

1. **Preventative Activities.** Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. **Property Protection.** Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. **Emergency Services.** Reduce impacts through response and recovery activities that are implemented during a disaster.
4. **Structural Projects.** Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. **Public Information.** Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Ranking Number [†]	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits ^{††}	Estimated Costs ^{††}
Example	2	Purchase homes in the 100 year floodplain and convert the space to a park	County Planning Department – Bob Jones, Director	HMGP & General Funds	5 years	Medium	Medium
1.							
2.							
3.							
4.							
5.							

[†] Rank Each Mitigation Action Higher = 1 Lower = 5

^{††} Benefit and Cost estimates should be based on these categories:

Less than \$100,000 = Low
 \$100,000 - \$500,000 = Medium
 More than \$500,000 = High

Next Steps



Communities / Stakeholders

1. Review and Provide Input on Hazard Prioritization
2. Continue Development of Mitigation Goals

Planning Team

1. Complete Risk Analysis
2. Develop Mitigation Projects

Questions



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